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EXAMINER

TRINH, THANH TRUC

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1795

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/807,190	Applicant(s) YAMAMOTO ET AL.	
	Examiner THANH-TRUC TRINH	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 March 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14 depends on claim 13 and recites limitation "said photovoltaic element includes a first conductivity type crystalline semiconductor layer and a substantially intrinsic non-single-crystalline semiconductor layer formed on said crystalline semiconductor layer, and said transparent conductive oxide is formed on said non-single crystalline semiconductor layer" in lines 2-6. It is unclear whether the first conductivity type crystalline semiconductor layer and the substantially intrinsic non-crystalline semiconductor layer are the same as those in claim 13.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
1. Claims 1, 3, 5-8 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka et al. (US Patent 6133522) in view of Kloppel et al. (PGPub 20030170449) and further in view of Nakajima et al. (US Patent 6297443).

Regarding claims 1, 5-7 and 10-11, as seen in Figure 5 and Example 1, Kataoka et al. teaches a photovoltaic device comprising a photovoltaic element comprising a first conductivity type crystalline semiconductor layer (p-type microcrystalline Si as seen in Example 1), a substantially intrinsic non-single-crystalline semiconductor layer formed on the first conductivity semiconductor layer (i-type a-Si as seen in Example 1); a transparent conductive oxide film (504 as seen in Figure 5), and a paste electrode (505 as seen in Figure 5), wherein the paste electrode containing a metal material (Ag or silver) and a resin material (epoxy). (See col. 9 lines 10-29). The resin material can contains 100% epoxy resin, therefore it meets the limitation of "at least about 60 percent by weight and not more than about 100 percent by weight of epoxy resin". The transparent conductive oxide film 504 is made of ITO, or $\text{SnO}_2\text{-In}_2\text{O}_3$. (See col. 9 lines 1-9). Kataoka et al. also teaches a copper tab or a tin foil (506a) attaching to the paste

electrode 505. (See col. 9 lines 30-37 or col. 14 lines 37-47). It is the Examiner's position that the copper tab or tin foil is an electric wire.

Kataoka et al. does not explicitly teach the transparent conductive oxide film having an arithmetic mean deviation of the profile (or mean surface roughness Ra) of not more than about 2 nm, nor do they teach the mean surface roughness is ranged from 0.5 nm to not more than about 1 nm. Kataoka et al. also does not teach a surface of a crystalline semiconductor layer has irregularities higher than the height of the irregularities on the surface of the transparent conductive oxide.

Kloppel et al. teach the transparent conductive oxide film of ITO having an arithmetic mean deviation of the profile (or surface roughness) of less than 1 nm. (See paragraph [0013]). Applicant's disclosure states that "the contact angle of water on the surface of the ITO film is at least about 40° and not more than about 74° when the arithmetic mean deviation of the profile (Ra) of the ITO film is in the range of at least 0.5 nm to not more than about 2 nm" (Specification, page 35 line 23 – Page 36 line 8 and Figure 8). As the surface roughness of transparent conductive oxide film (ITO) in the range of less than 1 nm and, the Examiner considers that the contact angle of water with respect to the surface of the transparent conductive oxide film is at least about 40° and not more than about 74°.

Nakajima et al. teaches texturing the polycrystalline photoelectric conversion layer with a thickness smaller than half of the polycrystalline photoelectric conversion layer and in the range from 0.05 to 3μm. (See Abstract of Nakajima et al.).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify to device of Kataoka et al. by having the surface roughness of ITO less than 1 nm as taught by Kloppel et al. and texturing the polycrystalline layer such as p-type microcrystalline of Kataoka et al. with a thickness of smaller than half of the microcrystalline layer and in the range of 0.05 to 3 μm as taught by Nakajima et al., because Kloppel et al. teaches it would avoid spikes by having the roughness of the ITO less than 1 nm, thereby enhancing conductivity and adhesion. (See paragraph [0005]-[0006]); and Nakajima et al. teaches that such textured photoelectric converter would generate a large photoelectric current by producing a light scattering structure for preventing incident light escaping from the photoelectric conversion layer. (See col. 1 lines 40-45 of Nakajima et al.). In such combination, the surface of the crystalline semiconductor layer (or polycrystalline, microcrystalline layer) has irregularities (with height of at least .05 μm) higher than the height of the irregularities of the transparent conductive oxide (or height of less than 1 nm)

Regarding claim 3, as seen in Figure 5 and Example 1, Kataoka et al. also teaches the photovoltaic element further comprising a second conductivity type non-single-crystalline semiconductor layer (n-type a-Si) formed on the intrinsic non-single-crystalline and the transparent conductive oxide film is formed on the second conductivity type non-single-crystalline semiconductor layer. (See col. 14 lines 17-47)

Regarding claim 8, Kloppel et al. teach the content of indium oxide in the ITO is 90% and that of the tin oxide is 10% (See paragraphs 0008 or 0027). It was found that the content of Sn in the transparent conductive oxide film is about 5% by weight.

2. Claims 4 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka et al. in view of Kloppel et al. and Nakajima et al., and further in view of Morizane et al. (PGPub 20010045505).

Regarding claim 4, Kataoka et al. in view of Kloppel et al. and Nakajima et al. teaches a photovoltaic device as described in claim 1. Kataoka et al. further disclose the intrinsic non-single-crystalline semiconductor layer (i-type a-Si) includes first and second intrinsic non-single-crystalline semiconductor formed on the upper and lower surfaces of the first conductivity type crystalline semiconductor (p-type μ c-Si), respectively. Kataoka et al. also describe a second conductivity type non-single crystalline (n-type a-Si) formed on the upper surface of the first intrinsic non-single-crystalline semiconductor layer, and the transparent conductive oxide film formed on the upper surface of the second conductivity type non-single-crystalline semiconductor layer. (See Figure 5 and col. 14 lines 17-47)

Kataoka et al. in view of Kloppel et al. and Nakajima et al. does not teach the first conductivity type non-single-crystalline semiconductor formed on the lower surface of the second intrinsic non-crystalline semiconductor layer, nor do they teach the transparent conductive oxide film includes a second transparent conductive oxide film formed on the lower surface of the fourth non-single-crystalline semiconductor layer.

Morizane et al. teaches a second first conductivity type non-single crystalline semiconductor (16) formed on the lower surface of the second intrinsic non-single-crystalline semiconductor (15), and a second transparent conductive oxide (17) film formed on the lower surface of the first conductivity type non-single-crystalline semiconductor layer. (See Figure 1 and paragraph [0052]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Kataoka et al. in view of Kloppel et al. and Nakajima et al. by having a second transparent conductive oxide film as taught by Morizane et al., because it would reduce defects on the interface, improve characteristics of the heterojunction interface and enable light to enter from both front and rear surfaces of the device. (See paragraphs [0051]-[0052]).

Regarding claim 12, Kataoka et al. in view of Kloppel et al. and Nakajima et al. teaches a photovoltaic device as described in claim 1. Kataoka et al. describe a plurality of the photovoltaic elements provided at a prescribed interval and connected in series by electric wires (copper tab and tin foil), wherein the photovoltaic element includes a first paste electrode formed on the upper surface of photovoltaic element. (See Figures 1 and 5, col. 14 lines 37-47).

Kataoka et al. in view of Kloppel et al. and Nakajima et al. does not teach a second paste electrode formed on the lower surface of the photovoltaic element.

Morizane et al. teaches using a second collector electrode (18). (See Figure 1 and paragraph [0052])

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Kataoka et al. in view of Kloppel et al. and Nakajima et al. by utilizing the second collector electrode as taught by Morizane et al., because it would enable light to enter from both front and rear surfaces. (See paragraph [0051]). In such combination, it would certainly have been obvious that the second collector electrode can be a paste collector electrode like the first collector electrode 505 of Kataoka et al.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to connect the first end of the electric wire (copper tab or tin foil) to the first paste electrode of one cell and the second end of the electric wire to the second paste electrode of another cell as taught by Morizane et al., because in this way the photovoltaic elements are connected in series as taught by Kataoka et al.

3. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka et al. in view of Kloppel et al. and Nakajima et al. and further in view of Kitae et al. (PGPub 20010005053).

Regarding claim 9, Kataoka et al. in view of Kloppel et al. and Nakajima et al. teaches a photovoltaic device as described in claim 1.

Kataoka et al. in view of Kloppel et al. and Nakajima et al. does not teach the paste electrode containing urethane resin in addition to the epoxy resin.

Kitae et al. teach providing urethane resin in addition to the epoxy resin in the paste electrode. (See paragraph [0071]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Kataoka et al. in view of Kloppel et al. and Nakajima et al. by utilizing urethane resin as taught by Kitae et al., because it would increase adhesion strength. (See paragraph [0076]).

4. Claims 13-15, 17-19, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka et al. (US Patent 6133522) in view of Kloppel et al. (PGPub 20030170449) and further in view of Nakajima et al. (US Patent 6297443).

Regarding claims 13, 17-18 and 21, as seen in Figure 5 and Example 1, Kataoka et al. teaches a photovoltaic device comprising a photovoltaic element comprising a first conductivity type crystalline semiconductor layer (p-type microcrystalline as seen in Example 1); a substantially intrinsic non-single crystalline semiconductor layer (a i-type a-Si as seen in Example 1) formed on the first conductivity type crystalline semiconductor layer; a transparent conductive oxide film 504, and a paste electrode 505, wherein the paste electrode containing a metal material (Ag or silver) and a resin material (epoxy). (See col. 9 lines 10-29). The resin material can contains 100% epoxy resin, therefore it meets the limitation of "at least 60 percent by weight and not more than about 100 percent by weight of epoxy resin". The transparent conductive oxide film

504 is made of ITO, or $\text{SnO}_2\text{-In}_2\text{O}_3$. (See col. 9 lines 1-9). Kataoka et al. also teach a tin foil (506a) attaching to the paste electrode 505. (See col. 9 lines 30-37 or col. 14 lines 37-47). It is the Examiner's position that the copper tab or tin foil is an electric wire.

Kataoka et al. does not explicitly teach the transparent conductive oxide provided with a surface having contact angle of at least about 40° and not more than about 74° with respect to water, or a surface of a crystalline semiconductor layer has irregularities higher than the height of the irregularities on the surface of the transparent conductive oxide.

Kloppel et al. teach the transparent conductive oxide film of ITO having a surface roughness of less than 1 nm (See paragraph [0013]). Applicant's disclosure states that "the contact angle of water on the surface of the ITO film is at least about 40° and not more than about 74° when the arithmetic mean deviation of the profile (R_a) of the ITO film is in the range of at least 0.5 nm to not more than about 2 nm" (Specification, Page 35 line 23 – Page 36 line 8 and Figure 8). As the surface roughness of transparent conductive oxide (ITO) film reduces to less than 1 nm, the Examiner considers that the contact angle of water with respect to the surface of the transparent conductive oxide film is at least about 40° and not more than about 74° .

Nakajima et al. teaches texturing the polycrystalline photoelectric conversion layer with a thickness smaller than half of the polycrystalline photoelectric conversion layer and in the range from 0.05 to $3\mu\text{m}$. (See Abstract of Nakajima et al.).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Kataoka et al. by providing a surface with contact angle of water from 40° to not more than about 74° as taught by Kloppel et al. and texturing the polycrystalline layer such as p-type microcrystalline of Kataoka et al. with a thickness of smaller than half of the microcrystalline layer and in the range of 0.05 to 3 μm as taught by Nakajima et al., because Kloppel et al. teaches it would avoid spikes by having the roughness of the ITO less than 1 nm, thereby enhancing conductivity and adhesion. (See paragraph [0005]-[0006]); and Nakajima et al. teaches that such textured photoelectric converter would generate a large photoelectric current by producing a light scattering structure for preventing incident light escaping from the photoelectric conversion layer. (See col. 1 lines 40-45 of Nakajima et al.). In such combination, the surface of the crystalline semiconductor layer (or polycrystalline, microcrystalline layer) has irregularities (with height of at least .05 μm) higher than the height of the irregularities of the transparent conductive oxide (or height of less than 1 nm)

Regarding claims 14-15, as seen in Figure 5 and Example 1, Kataoka et al. further describe the photovoltaic element further comprising a first conductivity type crystalline semiconductor layer (p-type microcrystalline Si); an intrinsic non-single crystalline semiconductor layer (i-type a-Si) wherein the transparent conductive oxide (504) is formed on the non-single-crystalline semiconductor layer, a second conductivity type non-single-crystalline semiconductor layer (n-type a-Si) formed on the intrinsic non-

single-crystalline and the transparent conductive oxide film is formed on the second conductivity type non-single-crystalline semiconductor layer. (See col. 14 lines 17-47)

Regarding claim 19, Kloppel et al. teach the content of indium oxide in the ITO is 90% and that of the tin oxide is 10% (See paragraphs 0008 or 0027). It was found that the content of Sn in the transparent conductive oxide film is about 5% by weight.

5. Claims 16 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka et al. (US Patent 6133522) in view of Kloppel et al. (PGPub 20030170449) and further in view of Morizane et al. (PGPub 20010045505).

Regarding claim 16, Kataoka et al. in view of Kloppel et al. and Nakajima et al. teaches a photovoltaic device as described in claim 14. Kataoka et al. further disclose the intrinsic non-single-crystalline semiconductor layer (i-type a-Si) includes first and second intrinsic non-single-crystalline semiconductor formed on the upper and lower surfaces of the first conductivity type crystalline semiconductor (p-type μ c-Si), respectively. Kataoka et al. also describe a second conductivity type non-single crystalline (n-type a-Si) formed on the upper surface of the first intrinsic non-single-crystalline semiconductor layer, and the transparent conductive oxide film formed on the upper surface of the second conductivity type non-single-crystalline semiconductor layer. (See Figure 5 and col. 14 lines 17-47)

Kataoka et al. in view of Kloppel et al. and Nakajima et al. does not teach the first conductivity type non-single-crystalline semiconductor formed on the lower surface of

the second intrinsic non-crystalline semiconductor layer, nor do they teach the transparent conductive oxide film includes a second transparent conductive oxide film formed on the lower surface of the fourth non-single-crystalline semiconductor layer.

Morizane et al. teach a second first conductivity type non-single crystalline semiconductor (16) formed on the lower surface of the second intrinsic non-single-crystalline semiconductor (15), and a second transparent conductive oxide (17) film formed on the lower surface of the first conductivity type non-single-crystalline semiconductor layer. (See Figure 1 and paragraph [0052]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Kataoka et al. in view of Kloppel et al. and Nakajima et al. by having a second transparent conductive oxide film as taught by Morizane et al., because it would reduce defective on the interface, improve characteristics of the heterojunction interface and enable light to enter from both front and rear surfaces of the device. (See paragraphs [0051]-[0052]).

Regarding claim 22, Kataoka et al. in view of Kloppel et al. and Nakajima et al. teaches a photovoltaic device as described in claim 13. Kataoka et al. describes a plurality of the photovoltaic elements provided at a prescribed interval and connected in series by electric wires (copper tab and tin foil), wherein the photovoltaic element includes a first paste electrode formed on the upper surface of photovoltaic element. (See Figures 1 and 5, col. 14 lines 37-47).

Kataoka et al. in view of Kloppel et al. does not teach a second paste electrode formed on the lower surface of the photovoltaic element.

Morizane et al. teaches using a second collector electrode (18). (See Figure 1 and paragraph [0052]))

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Kataoka et al. in view of Kloppel et al. and Nakajima et al. by utilizing the second collector electrode as taught by Morizane et al., because it would enable light to enter from both front and rear surfaces. (See paragraph [0051]). In such combination, it would certainly have been obvious that the second collector electrode can be a paste collector electrode like the first collector electrode 505 of Kataoka et al.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to connect the first end of the electric wire (copper tab or tin foil) to the first paste electrode and the second end of the electric wire to the second paste electrode as taught by Morizane et al., because in this way the photovoltaic elements are connected in series as taught by Kataoka et al.

6. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka et al. in view of Kloppel et al. and Nakajima and further in view of Kitae et al. (PGPub 20010005053).

Regarding claim 20, Kataoka et al. in view of Kloppel et al. and Nakajima teaches a photovoltaic device as described in claim 13.

Kataoka et al. in view of Kloppel et al. and Nakajima does not teach the paste electrode containing urethane resin in addition to the epoxy resin.

Kitae et al. teach containing urethane resin in addition to the epoxy resin in the paste electrode. (See paragraph [0071]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Kataoka et al. in view of Kloppel et al. and Nakajima et al. by utilizing urethane in the resin as taught by Kitae et al., because it would increase adhesion strength. (See paragraph [0076]).

Response to Arguments

Applicant's arguments with respect to claims 1-28 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues Kloppel does not teach or suggest "a surface of the transparent conductive oxide film has irregularities with a height, and wherein a surface of a crystalline semiconductor layer has irregularities higher than the height of the irregularities on the surface of the transparent conductive oxide film." However, Applicant's argument is directed to a new limitation, therefore it is moot to a new ground of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh-Truc Trinh whose telephone number is 571-272-6594. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1795

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TT

6/16/2008

/PATRICK RYAN/

Supervisory Patent Examiner, Art Unit 1795